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Folksonomies and the New Order:
Authority in the Digital Disorder

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ABSTRACT: While the organization and representation of information and knowledge have historically been done by professionals, the rise of social media has spread the notion that this can be done more collaboratively. A more collaborative approach would entail a change in the role of professionals and in the goals and values of the systems. This paper explores the notion of authority and the role of professionals in a changing environment where more people participate in the organization and representation of information and knowledge. The paper questions the traditional role of the professionals and argues that systems must be designed to facilitate trust and authority, and that the authority of folksonomies and systems comes from the users' collective interpretations and meaning production.

We used to rely on philosophers to put the world in order. Now we've got information architects. But they're not doing the work - we are.
– Bruce Sterling, Writer, speaker, futurist, design instructor

1.0 Introduction

Until very recently, the universe of knowledge was put in order by professionals. These professionals had an array of job titles, including librarians, information architects, taxonomists, ontologists. They had in common a commitment to ordering the universe of knowledge by devising systems—such as classification systems, taxonomies, and thesauri—by which information objects (I here use the term "object" interchangeably for information and documents, including books, journal articles, resources, photos, images, video clips, web pages, blog entries, etc.; in other words, for anything that someone has created to ex-pressed ideas, opinions, claims or facts) could be ordered and made sense of. These professionals were the experts. They were experts in organizing information and knowledge, in designing and constructing knowledge organization systems, and in planning the use of such systems. They created order out of chaos, by imposing an order to the universe of knowledge; this order could be seen to reflect a given natural order, a perceived natural order, a stated natural order, or simply a non-reflective order. Regardless, they imposed an order from a particular viewpoint and presented only one of many possible orders.

Today, social media have facilitated the creation of order in the universe of knowledge that is organic and

created by the people who are engaged with the information objects. Professionals have historically created order in the universe of knowledge based on analysis and understanding of objects in the universe of knowledge and their use. Folksonomies, on the other hand, emerge without the involvement of professionals' interpretation and the users of the systems and the objects create order collaboratively.

In reaction to the idea that there is one correct way to order knowledge (see Miksa (1998) for an extended discussion of the concept of the "universe of knowledge" and the attempt to finding the one, best way to organize the universe of knowledge), a dominating discussion in information science in the past decades has been how to emulate actors' behavior and thinking when creating order in the universe of knowledge (cf., Hjørland and Albrechtsen 1995; Pejtersen and Albrechtsen 2000; Nielsen 2001). That discussion was based on the notion that professionals needed to understand actors to organize their knowledge for them and others who might be interested in their knowledge. It has been argued that to order the universe of knowledge one needs to understand the purposes, goals, and activities of the actors for whom the knowledge is ordered—and it has been argued that there is not one correct order, but many equal correct orders of the universe of knowledge (Mai 2008). While much has been gained from that discussion, the discussion has not addressed situations (like the Web and large libraries) where there is no unified purpose, goal, or activity that an order can support.

Folksonomies have come about in part in reaction to the perception that many classificatory structures represent an outdated worldview and in part from the belief that since there is no single purpose, goal, or activity that unifies the universe of knowledge. The argument is, therefore, that individual people engaged with the knowledge are in the best position to order it (Shirky 2005; Weinberger 2007). These ideas have created a movement (I use the term "movement" here to avoid focusing exclusively on the technologies. While it is clear that the technologies support the changes in the information landscape, the impetus and impact beyond the technologies) in which people engage in tagging documents, events, places, data, information, and other objects and ideas that people are engaged with. It should be noted at this point, that while professional systems and folksonomies share a number of properties, the two traditions often do not intersect, and more work is needed to understand their similarities and differences (Tennis and Jacob 2008).

While there have been a number of studies that have asked how and why people tag and create folksonomies (Golder and Huberman 2006; Kipp and Campbell 2006; Smith 2008), few have discussed the impact these activities have on the conceptual foundation of the creation and discovery of classificatory structures. This paper reviews the notion of order in the universe of knowledge and discusses how social technologies and movements put pressure on the notion of order and our abilities to create order in the universe of knowledge. The paper presents a path forward toward collaborative, democratic knowledge organization systems and explores how the systems' authority is impacted along the way.

2.0 Naming

A prerequisite for creating order in a universe of knowledge is that the entities in the universe are named. We need to be able to point out stuff and say that it is this or that, and that this stuff goes over here to this category and this other stuff goes over there to some other category. We can think of naming as "the act of bestowing a name, of labeling, of creating an identity. It is a means of structuring reality. It imposes a pattern on the world that is meaningful to the namer" (Olson 2002, 4). In other words, by giving objects names we simultaneously give the entities identities and impose a certain structure on reality; in this sense, naming is a sort of ordering. The name of an entity is often the name of the category that that entity belongs to, and the two—naming and ordering—cannot be separated epistemologically (Zerubavel 1991). Naming is the first act of formal ordering; though the act of naming also involves orders. (How entities are named and how we establish the meaning of words is, of course, a tremendously complex issue, which I will not explore in the paper. I think it is sufficient to acknowledge, in the words of David Blair (1990, 122) that: "The process of representing documents for retrieval is fundamentally a linguistic process, and the problem of describing documents for retrieval is, first and foremost, a problem of how language is used." As discussed by Wittgenstein (1953) and others following him, the meaning of words is established through the use of language in particular contexts and is attached to particular activities.)

For certain purposes, in certain contexts, in specific times, and so on, people will name the same entities in similar fashions. In other words, given a set of constraints, people will agree on how to name entities—the more constraints, the higher the agreement;

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the fewer constraints, the less agreement. Within information science, a host of indexer consistency studies have demonstrated this fact; these studies generally found that if a group of people were given a text and asked what it was about, they would produce a greater variety of terms if they were given fewer constraints compared to situations where they were given more constraints (Furnas et al. 1987; White and Griffith 1987; Sievert and Andrews 1991; Olson and Wolfram 2008). Typical constraints were: using a particular controlled vocabulary, indexing with a specific user group in mind, level of experience with indexing, familiarity with the subject matter to be indexed, etc. The main focus of these studies was to establish the degree to which different indexers would assign the same concept (or index term) to particular documents. The underlying assumption was that the quality of indexing is correlated with this inter-indexer consistency measure. However, what I think the studies actually demonstrated was that: 1) people are pretty good at saying what something is about; 2) people have lots of ideas for how the content of a document can be expressed; and, 3) context, purpose, and time do shape what is being said about something. This plurality is a good thing in some situations, however the studies were often done with libraries and other controlled institutions in mind, and in such situations, plurality and inconsistency are problematic because the goal of such institutions is to create systems that are stable and predictable (Mann 1987). (I use the notion of "controlled institutions" here as it refers to agencies and services for whom consistency and context-independence is important. Libraries are the prime example. Indexing and abstracting agencies are another example. But many web-services also aim to control the vocabulary and form a context-independent point of view.) It is believed that the stability and predictability is achieved through consistency—and one measure of quality, within this approach, of a given system or service is the degree to which it produces consistency among the names used for particular information objects. In situations where a plurality of viewpoints is celebrated, consistency would not be an appropriate measure of quality.

The main approach taken in libraries and other controlled institutions is that professionals in these environments ask: "What is it about?" The professional indexers' and classifiers' task is to find terms that can represent the objects so that others can find them. This is an almost impossible task, especially for systems that serve a large and heterogeneous user group and bring order to an enormous amount of information, like libraries and the Web. Professionals working in smaller settings serving more homogenous user groups, with specific goals and objectives, should be able to answer the question: "What is it about?" if the question is qualified, "What is it about, given this context?" Again, the more constraints, the higher the agreement and the more workable is the notion of indexing

In large and heterogeneous settings where there are no unified contexts, goals, or objectives against which the objects can be named and ordered, professionals cannot, in a meaningful way, answer the question: "What is it?" In these contexts, it might be more meaningful and useful to ask: "What does it mean for me?" or "How or for what do I use it?" This was the context in which millions of users of the Web found themselves in the early 21st century, and "faced with an ever-increasing flow of possibly useful information, "ordinary" users (i.e. non-information organization specialists) took matters in their own hands. By assigning "tags"—identifiers and at times reminders of meaningful information—users unwittingly gave rise to a new information organization system" (Wichowski 2009). Folksonomies, or social tagging, came about accidently, without an overreaching theoretical framework and without a specific mission in mind, except to create something that works for those creating it, as noted by Quintarelli (2005):

> Folksonomies are not a theory or a top-down strategy: they were born out of a feature (folk classification tools) introduced by software like Del.icio.us <http://del.icio.us>, Flickr <http://www.flickr.com>, 43things <http://www.43things.com>, Furl <http://www.furl.net>, Technorati <http://www.technorati.com>, etc. and from people using these platforms to tag their contents (links, photos, etc.).

(See Wander Val (2007) for a fuller exploration of how the term "folksonomy" came about.)

Naming entities in the world is a tricky business. If one attempts to name from the point of nowhere, one will almost for certain find that some people, somewhere have a different interpretation and a different name for the entity. Embedded in Olson's aforementioned definition is the notion that the namer names the world from his or her point of view; naming is a personal thing. This is the reason why professional naming, indexing, has its limits—it can only be done within a given context, and why folksonomies

seem so messy to many. This messiness, however, is also the strength of folksonomies, especially if the messiness can be controlled and represent the plurality of viewpoints.

3.0 Authority and Sharing

Tagging and folksonomies are conceptually related to democratic indexing. Democratic indexing was first introduced by Brown and Hidderley in the mid-1990's (Brown et al. 1996) and is "intended for use in a dynamic system which allows users to contribute to the retrieval process rather than a more traditional model which assumes that retrieval mechanisms are constructed by the librarian/indexer" (Brown et al. 1996, 109). The basic idea in democratic indexing is that a user can freely assign a term, a tag, to an object in the system; these terms are then viewable for the specific user in a private view. All terms assigned to a given object in the system are put into a reconciliation process to determine terms that will be available in a public view to all users of the system. The reconciliation process evaluates the relative importance of each suggested term for each object in this way (Brown et al. 1996, 115):

> The system checks every private view and lists the terms used, combining duplicates and adding a count (the count is the number of times a term has been used)
> Then for each term the system takes the count and divides it by the number of private views for that particular [object]. The result is normally expressed as a percentage.
> If this result is greater than a threshold value a link is created between the term and the [object]. The process continues until all [objects] have been evaluated and their associated terms recorded in the Public View.

(Brown et al. discuss the notion of democratic indexing in the context of an image database. I have here exchanged the word "image" with the word "object." There is no reason to limit the application of democratic indexing to images. I am using the term "object" to broaden the perspective.)

This process is democratic (I regret the political metaphors that have been used to characterize these systems, but I do not think that this paper is the right forum to suggest an alternative terminology) in the sense that the shared, or public, terms are those terms which users of the system collectively determine to

be the best terms to represent a given object. In this sense, the terms selected to represent the object are those that are selected as the most popular by the people using the system. (One could imagine that the system would be refined slightly by limiting the possible number of terms assigned to each object. One would expect that precision would increase with fewer highly popular terms, though one could argue that a greater diversity among terms would facilitate a high recall.)

In folksonomies and social tagging systems, the shared terms are any and all terms suggested by any user of the system. In this sense, folksonomies and social tagging systems cannot be characterized as democratic, as Feinberg (2006, 6) has noted:

> While social classification systems may be democratic in terms of being open to all participants, this characterization does not extend to any sense of the community coming together to determine how resources should be indexed, even by voting. If any political characterization of authority is accurate, social classification is more like libertarianism, where everyone's whims are allowed to flourish.

Both approaches, democratic indexing and folksonomies, share, however, the basic principle that terms are "no longer derived from document texts and expert understanding of terminology in a given subject area, but [are] derived from responses of users to particular [objects]" (Brown et al. 1996, 118). In particular, democratic indexing was a response to "the issues of connotation, specifically to the issue of whether a 'spectrum of connotation,' based on the range of possible meanings available in society at a particular moment, might exist" (Rafferty and Hidderley 2007, 406). The major implication by this is the shift from assuming professionals are in the best situation to interpret, create meaning, and represent information objects to the belief that users ought to create the meaning and represent the objects themselves. (The distinction between "professionals" and "users" are here drawn along the lines of whether it is within the person's paid job to categorize and represent objects for others. Users can certainly be professionals, in the sense that a doctor can tag resources on health issues. It is clear that the more one explores the distinction, the more it blurs.) The democratic approach to indexing, therefore "determines the authority from the agreement of its users: its warrant comes from the constructive interpretation of its users" (Rafferty and

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Hidderley 2007, 406). In other words, the authority and trustworthiness of the system comes from the collective agreement among the users about the best terms to represent a particular object and, as such, the warrant of the system is the users' interpretation of the object. This not only shifts the authority of the system from professionals to users, it also introduces an alternative conception of warrant.

The concept of warrant has a long history in library and information studies, and can be defined as (Beghtol 1986, 110):

> In general, the warrant of a classification system can be thought of as the authority a classification invokes first to justify and subsequently to verify decisions about what classes/concepts to include in the system, in what order classes/concepts should appear in the schedules, what units classes/concepts are divided into, how far subdivision should proceed, how much and where synthesis is available, whether citation order is static or variable and similar questions. Warrant covers conscious or unconscious assumptions and decisions about what kinds and what units of analysis are appropriate to embody and to carry the meaning or use of a class to the classifier, who must interpret both the document and the classification system in order to classify the documents by means of syntactic devices.

Library classification systems have traditionally used literary warrant to justify the inclusion of terms and classes. In literary warrant, it is the literature in particular domains that are used to justify the inclusion of terms and classes in the vocabulary (Svenonius 2000). Other types of warrant have been suggested in the literature, including semantic warrant (Beghtol 1986), use warrant, structural warrant (Svenonius 2000), user warrant (NISO 1994), and cultural warrant (Beghtol 2001). The basic idea behind warrant, as stressed in Beghtol's aforementioned definition, is that the justification for inclusion of terms and classes are based on something external to the professional's knowledge or beliefs. The professional representing and classifying objects assigns terms and creates classes with reference to those external sources. The basic point is that it is not the professional's personal belief or views of the world that determines whether a term is used to represent an object or how a class is constructed. The professional should be able to point to something and justify the inclusion of the

term or class, because of the fact that it appears in these external sources. The warrant establishes and protects the professional's authority.

The kind of authority that warrant is supposed to invoke is cognitive authority, as opposed to administrative authority in which one has authority by virtue of being in a particular position (Wilson 1983). Cognitive authorities are those people who we recognize as having a proper influence on one's thinking, ideas, and decisions because we trust them. Administrative authorities are given "a recognized right to command others, within certain prescribed limits" (Wilson 1983, 14) and, as such, professional indexers are administrative authorities whom some body has given the right to interpret and represent the objects. They are experts in the sense that they have a certain body of knowledge about indexing, but we should remember that "one can be an expert even though no one else realizes or recognizes that one is" (Wilson 1983, 13) and we might or might not trust an administrative authority beyond the prescribed limits and recognize professional indexers as cognitive authorities.

In most instances of warrant, information professionals invoke "institutionalized cognitive authority" (Wilson 1983, 82) to justify the assignment of terms and creation of classes. They will refer to the literature, to users, to use of the objects, etc., and, as such, these sources act as institutionalized cognitive authorities for the professionals and help support the professionals' decisions. In other words, a professional makes a decision regarding the assignment of a term or the creation of a class in an authoritative way, not because the professional has first-hand knowledge of the appropriateness of the term or class, but because the professional relies on second-hand knowledge gained from cognitive authorities. For a system to have authority, it is not enough that the professionals are experts or that the system is published or produced by a respected entity; users of the system must recognize the system and the professionals who produced it as cognitive authorities. Users must trust the people behind the system. (Exactly how professionals gain status as cognitive authorities is a complex matter and beyond the scope of this paper. It is sufficient here to note this interrelation between authority and warrant.)

In democratic indexing and folksonomies, there are no professionals to assign terms and create classes and, as such, no external warrant per se; there is no institutionalized cognitive authority that is used to justify the inclusion of terms and classes. The authority of folksonomies and democratic indexing systems

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comes from the users' collective interpretations and meaning production. Whereas professional indexers and classificationists can point to more or less formal analyses and surveys of the literature, the users, the use, etc. and justify their work (Mai 2008), contributors to folksonomies do not, generally speaking, base their selection of tags on external sources. As such, an alternative conception of warrant emerges; in this conception the authority is created within the system. I propose to call this phenomenon autopoietic warrant. Here users of the system in a self-referential manner establish the terms and classes to be included in the system and the authority of the system emerges from its use. Autopoiesis is the best way to describe this, since autopoiesis denotes a living system that "holds constant its organization and defines its boundaries through the continuous production of its components" (Winograd and Flores 1986, 44). Folksonomies are exactly living systems that are collections "of components constituting a unity that can live or die" (Winograd and Flores 1986, 45), one of those components is the trustworthiness of the system, its authority.

The shift from professionalism to everyone (to use Shirky's term from his book *Here Comes Everyone*) requires not only that we consider the conceptual foundational of the activities to ground them solidly and adapt key concepts to this new environment, but also that we design systems that actually do facilitate the creation of order in the universe of knowledge in a responsible, democratic, and meaningful manner.

4.0 Towards Collaboration

Shirky (2008) suggests a useful framework for thinking about the progression and possibilities of social technologies. The framework consists of four progressive levels:

– Sharing: Sharing is the basic criteria for social technologies, the basic building block for any social technology is that there are people who are willing to share information, ideas, thoughts, or anything else with others. Where there is no sharing, there is no social technology. Sharing largely occurs in a "take-it-or-leave-it fashion, which allows for the maximum freedom of the individual to participate while creating the fewest complications of group life" (Shirky 2008, 49).
– Cooperation: Once people have started to share, they can start cooperating on something or the other. This level requires the change of behavior of

people interacting and as such "cooperation creates identity—you know who you are cooperating with. One simple form of cooperation … is conversation" (Shirky 2008, 50). Conversation can take place via text or some other form of interaction, like voting. Cooperation takes sharing to the next level and creates group identity, but each individual contributor still engages to advance his/her own personal goals.
– Collaborative production: Once a group more or less formally decides to collaborate on a project, the individual's goal will compete with the group's overall goal, Shirky explains, "the litmus test for collaborative production is simple: no one person can take credit for what gets created, and the project could not come into being without the participation of many" (Shirky 2008, 50). Collaboration builds on sharing and cooperation, but extends it by having group members make collective decisions about the project.
– Collective action: The highest level of social activities is also the "hardest kind of group effort, as it requires a group of people to commit themselves to undertaking a particular effort together, and to do so in a way that make the decision of the group binding on the individual members" (Shirky 2008, 51). The idea here is that individual members are bound by the group's decision and action, like within a union where individual members are bound by the agreements made by the collective whole.

Folksonomies are, in this framework, at the sharing level. At sites like Delicious (formerly known as "del.icio.us" http://en.wikipedia.org/wiki/Del.icio.us) and Flickr, users share tags (and websites and photos) with each other, but there is little cooperation or even collaboration among the users about the tags and folksonomy, though there is interaction among the users about the content of the sites.

There were a few early attempts to organize the Web in a collaborative fashion (Dmoz http://www.dmoz.org, http://en.wikipedia.org/wiki/Dmoz and Zeal http://en.wikipedia.org/wiki/Zeal_(web) are the best examples), these were known as open content directories and users collaborated on creating classificatory structures for the directory and classified websites using the directory. Users could advance to become editors of particular sections of the directory where they oversaw the development of that section. Often detailed discussions broke out about the structure in particular sections, and there were a few in-

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stances where staff removed users (http://www.dmoz.org/newsletter/2000Sep/removal.html) from their editorial status. It appears that interest in this sort of collaboration across the entire spectrum of the Web has weaned, probably because the projects did not create group identity among the participants, which, according to Shirky (2008), is a criterion to advance to the cooperation level. My sense is that the initiatives folded because the entire Web is too large a domain within which group identity can be achieved. Also, and probably more importantly, Google and other search engines excelled and essentially outperformed the directory approach to search the Web. Wikipedia is similar to the open content directories in the sense that people have come together to create an entire encyclopedia, and they have organized their work using an organizational structure quite similar to that of Dmoz and Zeal. The success of Wikipedia and hundreds of open source software projects demonstrates, however, that collaborative production can bring value to society and transform previous models of work organization.

While Brown et al.'s (1996) proposal for a democratic indexing system does aim for a consensus on which terms should represent objects in the public view, the consensus is not reached through cooperation or collaboration among users, but is merely programmed into the system and reached automatically. There is no reason, however, that the democratic indexing model could not be taken a step further and fine-tuned to reach higher levels of social activity. A more meaningful approach would be to have users actively vote on the individual tags and thereby determine which tags are promoted to the "public view", as the shared tags. While the motivation to tag objects often comes from a personal interest in the objects, and some tags do reflect this personal use (Nov 2007; Nov and Yee, forthcoming), it is not unlikely that users would be able to participate in the "constructive interpretation" (Rafferty and Hidderley 2007, 406) on behalf of a larger community. Such a voting mechanism would enhance the interactive nature of the system and it might bring about a group identity among the users and stimulate real cooperation in achieving a larger, common goal.

A step even further up the levels of social activities would come about if the system facilitated a "back-and-forth talking and editing" (Shirky 2008, 50) about tags among the users. The shared tags chosen for individual objects would then be chosen by the members of the group through a discussion and interaction among the members, perhaps based on a vote among a larger group of people. This kind of system would allow for true collaborative production of folksonomies and also be true to democratic principles.

The design of systems that facilitate cooperation and collaboration in the construction of folksonomies will further the original goals of both the social technology movement and the democratic indexing approach; it allows users to interactively establish the meaning of the objects and create a consensual order in the universe of knowledge.

5.0 Conclusion: Knowledge Organization Orders and Authority

When everyone participates in bringing order to the universe of knowledge, the abundance of interpretations and meanings that people might make of individual information objects is brought forward. This plurality of opinions and viewpoints can be celebrated and used to advance the goals of any knowledge organization system, namely to ease the retrieval of information. While there have been tremendous pressures on the traditional model of knowledge organization, which purports an authoritarian position, from theoretical work in the area, the advent of folksonomies and social tagging has demonstrated that a social constructivist approach (cf., Rafferty and Hidderley 2007) to representing and organizing information can work in practice.

The core differences between the two approaches lies in their different values and success factors, and is best expressed in how they handle naming and authority. The chart below compares the approaches (see Table 1).

Folksonomies create a new order in the knowledge organization landscape. The objectives of knowledge organization have, for decades, been to create systems that serve as many people as possible and do so from a perspective that the systems ought to be neutral and objective. While there has much conceptual and theoretical work that has sought to establish alternative frameworks for knowledge organization practice, few have had an impact on practice. Folksonomies, on the other hand, have come about without an overarching conceptual framework, but out of the entrepreneurial spirit in the age of the social Web. The practice of meaning-making, representing, and organizing information objects has been enriched by the pressure from the social technologies and movements to involve everyone–and to allow for a plurality of viewpoints and opinions.

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	Authoritarian Professional, expert-based	Collaborative Democratic, everyone
Values	Transparency, consistency, interoperability, stability, professionalism	Inclusiveness, openness, conversation, collaboration, interpretation
Success factors	Understand and match users' information needs, ability to reflect the domain's structure, ability to modify system accordingly to changes in domain	Involvement of users in meaning making, ability to facilitate collaboration among users, ability to accommodate diverse interpretations
Challenges	Analyzing the domain and understanding it and its users' information needs	Getting people involved in sharing interpretations and collaborating on a shared goal
Naming	Information objects are named centrally by professionals	Information objects are named locally by users
Authority	Established through reference to external sources	Established through autopoietic warrant

Table 1. Comparison of two approaches knowledge organization

Information professionals need to consider how their role and authority are being pushed by the emergence of social media, and how users might best be supported to engage actively in meaning-making and collaboration. This requires that the goals and values of the system we design and promote are modified, and it requires that information professionals avoid conflating administrative authority with cognitive authority.

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